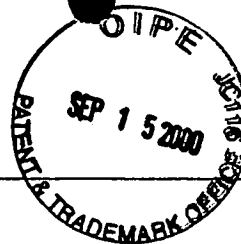


SEQUENCE LISTING



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TECH CENTER 1600/2900

<110> SIN, Yoke Min  
LAM, Toong Jin  
GONG, Zhiyuan

<120> A RECOMBINANT VACCINE AGAINST FISH INFECTIOUS DISEASES

<130> Applied Research

<140> 09/196,161

<141> 1998-11-20

<150> 9803188-3

<151> 1998-09-28

<160> 19

<170> PatentIn Ver. 2.1

<210> 1

<211> 105

<212> PRT

<213> Artificial Sequence

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<221> MUTAGEN

<222> (2)

<223> A/S WHERE S HAS BEEN DERIVED FROM THE SYNTHETIC  
GENE.

<220>

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<222> (4)..(105)

<223> Q - THE GLUTAMINE CODONS TAA AND TAG IN THE  
ORIGINAL SEQUENCE, HAVE BEEN REPLACED WITH THE  
UNIVERSAL GLUTAMINE CODONS CAG OR CAA IN THE  
SYNTHETIC GENE

<220>

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<222> (34)

<223> V/G WHERE G HAS BEEN DERIVED FROM THE SYNTHETIC  
GENE.

<220>

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<222> (105)

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GENE.

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Gly Ala Ala Gln Gly Glu Ala Asn Gly Asn Gln Pro Phe Ala Ala Asn  
1 5 10 15

Asn Ala Ala Arg Gly Ile Cys Val Pro Cys Gln Ile Asn Arg Val Gly  
20 25 30

Ser Val Thr Asn Ala Gly Asp Leu Ala Thr Leu Ala Thr Gln Cys Ser  
35 40 45

Thr Gln Cys Pro Thr Gly Thr Ala Leu Asp Asp Gly Val Thr Asp Val  
50 55 60

Phe Asp Arg Ser Ala Ala Gln Cys Val Lys Cys Lys Pro Asn Phe Tyr  
65 70 75 80

Tyr Asn Gly Gly Ser Pro Gln Gly Glu Ala Pro Gly Val Gln Val Phe  
85 90 95

Ala Ala Gly Ala Ala Ala Ala Gly Val  
100 105

<210> 2

<211> 316

<212> DNA

<213> *Ichthyophthirius multifiliis*

<220>

<221> CDS

<222> (1)..(315)

<400> 2

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Gly Ala Ala Gln Gly Glu Ala Asn Gly Asn Gln Pro Phe Ala Ala Asn  
1 5 10 15

aat gct gct aga ggt ata tgt gta cca tgc caa ata aac aga gta ggc 96  
Asn Ala Ala Arg Gly Ile Cys Val Pro Cys Gln Ile Asn Arg Val Gly  
20 25 30

tct gtt acc aat gca ggt gac tta gct act tta gcc aca taa tgc agt 144  
Ser Val Thr Asn Ala Gly Asp Leu Ala Thr Leu Ala Thr Gln Cys Ser  
35 40 45

act taa tgt cct act ggc act gca ctt gat gat gga gtg aca gat gtt 192  
 Thr Gln Cys Pro Thr Gly Thr Ala Leu Asp Asp Gly Val Thr Asp Val  
 50 55 60

ttt gat aga tca gcc gca taa tgt gtt aaa tgc aaa cct aac ttt tac 240  
 Phe Asp Arg Ser Ala Ala Gln Cys Val Lys Cys Lys Pro Asn Phe Tyr  
 65 70 75 80

tat aat ggt ggt tct cct taa ggt gaa gct cct ggc gtt taa gtt ttt 288  
 Tyr Asn Gly Gly Ser Pro Gln Gly Glu Ala Pro Gly Val Gln Val Phe  
 85 90 95

gct gct ggt gct gcc gct gca ggt gtt g 316  
 Ala Ala Gly Ala Ala Ala Ala Gly Val  
 100 105

<210> 3  
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 <213> Ichthyophthirius multifiliis

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 Gly Ala Ala  
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<210> 4  
 <211> 6  
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 1 5

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 Ile Asn Arg Val Gly Ser Val Thr Asn Ala Gly Asp Leu Ala Thr Leu  
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 Ala Thr

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<400> 6  
Cys Ser Thr  
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<210> 7  
<211> 20  
<212> PRT  
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Cys Pro Thr Gly Thr Ala Leu Asp Asp Gly Val Thr Asp Val Phe Asp  
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Arg Ser Ala Ala  
20

<210> 8  
<211> 15  
<212> PRT  
<213> Ichthyophthirius multifiliis

<400> 8  
Cys Val Lys Cys Lys Pro Asn Phe Tyr Tyr Asn Gly Gly Ser Pro  
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<210> 9  
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<212> PRT  
<213> Ichthyophthirius multifiliis

<400> 9  
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1 5

<210> 10  
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<400> 10

Val Phe Ala Ala Gly Ala Ala Ala Ala Gly Val  
1 5 10

<210> 11

<211> 316

<212> DNA

<213> Ichthyophthirius multifiliis

<220>

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<222> (1)..(315)

<400> 11

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Gly Ser Ala Gln Gly Glu Ala Asn Gly Asn Gln Pro Phe Ala Ala Asn  
1 5 10 15

aat gct gct aga ggt ata tgt gta cca tgc caa ata aac aga gta ggc 96  
Asn Ala Ala Arg Gly Ile Cys Val Pro Cys Gln Ile Asn Arg Val Gly  
20 25 30

tct ggt acc aat gca ggt gac tta gct act tta gcc aca caa tgc agt 144  
Ser Gly Thr Asn Ala Gly Asp Leu Ala Thr Leu Ala Thr Gln Cys Ser  
35 40 45

act cag tgt cct act ggc act gca ctt gat gat gga gtg aca gat gtt 192  
Thr Gln Cys Pro Thr Gly Thr Ala Leu Asp Asp Gly Val Thr Asp Val  
50 55 60

ttt gat aga tca gcc gca cag tgt gtt aaa tgc aaa cct aac ttt tac 240  
Phe Asp Arg Ser Ala Ala Gln Cys Val Lys Cys Lys Pro Asn Phe Tyr  
65 70 75 80

tat aat ggt ggt tct cct cag ggt gaa gct cct ggc ctt cag gtt ttt 288  
Tyr Asn Gly Gly Ser Pro Gln Gly Glu Ala Pro Gly Leu Gln Val Phe  
85 90 95

gct gct ggt gct gcc gct gca gga att c 316  
Ala Ala Gly Ala Ala Ala Ala Gly Ile  
100 105

<210> 12

<211> 105

<212> PRT

<213> Ichthyophthirius multifiliis

<400> 12

Gly	Ser	Ala	Gln	Gly	Glu	Ala	Asn	Gly	Asn	Gln	Pro	Phe	Ala	Ala	Asn
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Asn	Ala	Ala	Arg	Gly	Ile	Cys	Val	Pro	Cys	Gln	Ile	Asn	Arg	Val	Gly
			20					25					30		

Ser	Gly	Thr	Asn	Ala	Gly	Asp	Leu	Ala	Thr	Leu	Ala	Thr	Gln	Cys	Ser
		35					40					45			

Thr	Gln	Cys	Pro	Thr	Gly	Thr	Ala	Leu	Asp	Asp	Gly	Val	Thr	Asp	Val
	50					55					60				

Phe	Asp	Arg	Ser	Ala	Ala	Gln	Cys	Val	Lys	Cys	Lys	Pro	Asn	Phe	Tyr
65					70					75					80

Tyr	Asn	Gly	Gly	Ser	Pro	Gln	Gly	Glu	Ala	Pro	Gly	Leu	Gln	Val	Phe
				85					90					95	

Ala	Ala	Gly	Ala	Ala	Ala	Ala	Gly	Ile
		100					105	

<210> 13

<211> 66

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic  
oligonucleotides

<400> 13

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agaggt						66

<210> 14

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic

oligonucleotides

<400> 14

accggtacca gagcctactc tgtttatttg gcatggtaca catatacctc tagcagcatt 60

<210> 15

<211> 66

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic  
oligonucleotides

<400> 15

accggtacca atgcagggtga cttagctact ttagccacac aatgcagtac tcagtgtcct 60  
actggc 66

<210> 16

<211> 59

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic  
oligonucleotides

<400> 16

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<210> 17

<211> 68

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence: synthetic  
oligonucleotides

<400> 17

cctgatcagc cgcacagtgt gttaaagtca aacctaacctt ttactataat ggtggttctc 60  
ctcagggt 68

<210> 18

<211> 69

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic  
oligonucleotides

<400> 18

gcgaattcct gcagcggcag caccagcagc aaaaacctga acgccaggag cttcaccctg 60  
aggagaacc 69

<210> 19

<211> 17

<212> DNA

<213> e. coli (XL1-Blue strain, Stratagene)

<400> 19

tagcatggcc tttgcag

17